State of Montana
Board of Oil and Gas Conservation

Docket No. ??-2019

Underground Injection Control Application

Dry Creek Field
Well-Chapman 13-2

Big Sky Energy, LLC.
April 26, 2019

Underground Injection Control (UIC) Permit Application
Dry Creek Field

The following is submitted in support of our application to permit the conversion of the Chapman 13-2 non-producing well for the purpose of water injection into the Frontier formation within the Dry Creek field, as required by rule 36.22.1403 of the rules and regulations of the Montana Board of Oil and Gas Conservation.

1(a) Well Locations:
The Chapman 13-2 will has been proposed for conversion and water injection within the proposed Dry Creek Field in Carbon County, Montana as described below. Currently the Chapman 13-2 well is non-producing from the Frontier formation. Attachment 1 shows the surface location and the circle of a quarter (1/4) mile radius representing the area of review (AOR) for this well.

Chapman 13-2	996FSL 1016 FWL	7S-21E-02 NE SW SW

1(b) **Wells within Quarter Mile AOR**
There are currently three (3) wells drilled within the ¼ mile AOR as listed below. One Well within the AOR is drilled to the Frontier Formation, one in Lance Formation, and one in the Virgelle Sandstone Formation.

Chapman 5	SW SW	7S-21E-02	Producing (Virgelle)
Chapman 2	NE SE SW	7S-21E-02	Plugged (Lance)
LP Chapman 24	NE SW SW	7S-21E-02	Shut In (Frontier)

1(c) **Location of All Pipelines**
Injection water will be delivered to the water injection well by buried pipeline. The water source for this this injector will be from the Dry Creek 2-13 Battery (7S - 21E - 02 SW SW). Injection waters will be a from the Lakota and Frontier formations.

1(d) **Area Producing Formations, Fresh Water Aquifers and Water Well Information**
The Virgelle Sandstone formation is the only producer within a ¼ mile of the proposed injection well location. The Virgelle produces at a depth of approximately 2,612 and 2621 feet, respectively.

Fresh water well data was obtained from the Montana Department of Natural Resources and Conservation, Water Resources Division. There are no fresh water wells, which produce within the AOR of the proposed injector. The closest fresh water wells are listed below (**OUTSIDE THE AOR**):

Well	Location	Depth of Well	Completion Date
Ray Gloss	7S-21E-02	37 Feet	9/21/1978
Perry Scheidecker	7S-21E-02	35 Feet	9/26/1978

1(e) **Name and Geological Description of Injection Zone**
The Injection zone in the Dry Creek Field is the 2nd Frontier Formation. Light-brownish-gray, fine-grained thick-bedded to massive, 'salt and pepper" sandstone. Total thickness about 350'.

A fracture gradient of 0.733 psi/ft is assumed for the area. An injection test will be performed during the completion of the well.

1(f) **Additional Information on Producing Wells in the AOR**

As stated previously, there are 3 wells drilled within the AOR. Only one of these wells has been drilled and produced in the Frontier formation, which hasn't produced since 9/30/2006. One in the Virgelle formation, and one in the Lance Formation, which was PA'd.
A summary of wellbores in the AOR is:

Chapman 5	**SW SW 7S-21E-02**	**Producing (Virgelle)**
Surface Casing:	15 ½ " Set @ 431' Cemented w/146 SX	
Intermediate:	13 3/8" Set @ 839' Cemented w/175 SX	
Production Casing:	8 5/8" Set @ 4697' Cemented w/ 450 SX	
Current Production:	1225 MCF Gas, 24 Bbl. Oil, 1 Bbl. water (January 2019)	

Chapman 2	**NE SE SW 7S-21E-02**	**Plugged & Abandoned (Lance)**
Plugged & Abandoned in 1916 @ 1300'		

LP Chapman 24	**SE SW 7S-21E-02**	**Shut In (Frontier)**
Surface Casing:	10 3/4" Set @ 169' Cemented w/169 SX	
Production Casing:	7" Set @ 5534' Cemented w/375 SX	
Current Production:	**NOT PRODUCED SINCE 9/30/2006**	

1(g) **Open Hole Logs**
Logs and geological information for the Chapman 13-2 well are currently on file with the MBOGC.

1(h) **Description of Wellbore Construction**
Appendix 2 shows the current wellbore configuration for the Chapman 13-2 water injection well.

1(i) **Description of Injection Fluid**
The injection fluid will consist of produced water from the Dry Creek 2-13 battery in the Dry Creek field. (1 well producing approximately 500 BWPD).

1(j) **Names of Owners of Record**
Big Sky Energy, LLC. is operator of the proposed Chapman 13-2. The surface owners within the AOR are presented in Appendix 6.

Attachments:

1. Map of ¼ mile area of review
2. Wellbore schematic
3. Sundry Notice
4. Water analysis
5. List of surface owners
6. Affidavit of notification

WORKOVER PROGRAM

Chapman 13-2 2-7S-21E

Convert Well to Water Injection

EQUIPTMENT REQUIRED ON LEASE

- Double service rig

Safety Conditions

H2S content=Nil

Procedures

1. Move rig onto location. Inspect rig and conduct JSA.
2. Raise derrick and attach guide wires.
3. Cement squeeze perforations @ 2028'-2048' and 2667-2677'.
4. Rig up & test 3000 psi BOP.
5. Test cement squeeze to 1000 psi.
6. Drill cement & CIBP @ 2218'.
7. Run cased hole gamma log.
8. Perforate 2nd Frontier 4698'-4718'
9. Pump 2000 gal. 15% HCL @ 1200-1400 psi.
10. Set packer @ 4598'.
11. Pressure test tubing a packer to 750 psi.

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Appendix 5
List of Surface Ownership

S11, T07 S, R21 E, NE4, NE4NW4	Quarter Circle JP Ranch LLC. C/O Robert S. Ball	420 NW 11th Ave. #1206 Portland OR, 97209
S11, T07 S, R21 E, NE4, NE4NW4	Wally & Aretta Papez	165 S. Dry Creek Rd., Bridger, MT 59014
S02, T07, R21 E, SE4	Quarter Circle JP Ranch LLC. C/O Robert S. Ball	420 NW 11th Ave. #1206 Portland OR, 97209
S02, T07, R21 E, SE4	Wally & Aretta Papez	165 S. Dry Creek Rd., Bridger, MT 59014
S02, T07S, R21 E, S2SW4	William S. Geist	719 19th LN W, Kirkland, WA 98033-4857